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Life Span of Chimpanzee Beds at the Mahale Mountains National Park, Tanzania

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INTRODUCTION

Population estimates of wild chimpanzees have been conducted by a variety of methods. Many researchers have adopted nest- or bed-count methods to estimate chimpanzee populations due to the difficulty of making direct observations of unhabituated chimpanzees[1, 2, 3, 4, 5].

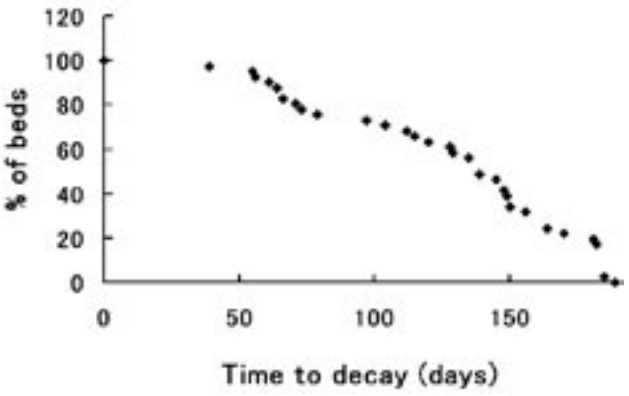
Ghiglieri[1] developed a chimpanzee population estimation method in which some parameters, such as average life span of beds, are assumed to be different at each study site and thus not obtained simply by bed censuses. Tutin and Fernandez[2] modified Ghiglieri's formula to take into account the non-random distribution of beds. However, this method also requires the average life span of beds. Hashimoto[3] as well as Plumptre and Reynolds[4] developed a method based on newly built beds. This method does not require average life span of beds but does require repeated censuses. Also, all three methods require presumptions such as the proportion of bed-building chimpanzees, rate of reuse of beds, and day-bed production to precisely estimate chimpanzee populations.

This paper presents the preliminary results of a study on the life span of beds at the Mahale Mountains National Park, which was made to examine the variations among the study sites.

Table 1. Definitions of age-classes of beds.

Age-class	Definition
Fresh	Vegetation green
Recent	Vegetation dry and changing color
Old	Vegetation dead but beds still intact
Rotting	Bed beginning to disintegrate

Fig. 1 Decay curve for beds monitored during the study period



METHODS

The Mahale Mountains National Park is located on the eastern shore of Lake Tanganyika. The chimpanzees in the Park have been studied since 1965[6]. The vegetation type in the study area was semi-deciduous or semi-evergreen gallery forest and *Brachystegia* woodland. The rainy season is from October to May, and the dry season is from June to September.

The field work was conducted from August to December 1995. Forty-three beds constructed on known dates by habituated M group chimpanzees were monitored about once a week to determine the life span of beds. Tree species, estimated height, and the presence of shade for each bed were recorded. All of the beds monitored were constructed in August.

Age-class of beds was defined according to Tutin and Fernandez[2], as shown in Table 1. I considered the life span of each bed to be the period from the date of construction to the date midway between the last weekly inspection when it was recognizable and the first when it was not.

RESULTS and DISCUSSION

Out of 43 beds, two beds (4.7%) were assumed to be reused by the chimpanzees. These beds were excluded from the calculation of life span. Mean and SD of life span of 41 beds were 130.7 days and 45.7 days, respectively. The life span of beds ranged from 30 to 189 days.

Figure 1 shows a decay curve for beds monitored during the study period. Plumptre and Reynolds[4] reported that the decay of beds in their study approximated an exponential decay curve, but this phenomenon was not found in this study. Plumptre and Reynolds[4] suggested that the decay rate should be calculated while assuming exponential decay, since this is not likely to be greatly affected by a small number of beds that

Table 2. Tree species of censused chimpanzee beds.

Local name	Scientific name	Family name	Number of beds
Lulumasha*	*Pycnanthus angolensis*	Myristicaceae	21
Kahwibiki	*Xylopia parviflora*	Annonaceae	7
Mbula*	*Parinari curatellifolia*	Rosaceae	3
Mulale	?	?	3
Bulonje	*Dracaena reflexa*	Agavaceae	1
Ihambwa*	*Ficus vallis-choudae*	Moraceae	1
Ihoko	*Lobelia stricklandae*	Lobeliaceae	1
Ikolyoko*	*Voacanga lutescens*	Apocynaceae	1
Ikubila*	*Ficus capensis*	Moraceae	1
Kakubabolo*	*Sterculia tragacantha*	Sterculiaceae	1
Mulyansekesi*	*Afrosersalisia cerasifera*	Sapotaceae	1
Mkamba*	*Chlorophora excelsa*	Moraceae	1
Mtelele*	*Stereospermum kunthianum*	Bignoniaceae	1
Total			43

*: Their products (fruits, leaves or piths) were eaten by chimpanzees.

Table 3. Comparison of life span of chimpanzee beds between two tree species.

Local name	Scientific name	Number of beds	Mean (Days)	Range (days)
Lulumasha	*Pycnanthus angolensis*	21	136	56-189
Kahwibili	*Xylopia parviflora*	7	126	61-170

Difference between species was not significant (Mann-Whitney's U-Test, n_1=21, n_2=7, z=0.58, p=0.56, 2-tailed).

last a very long time; however, the present study did not support this assumption.

Monitored beds were usually constructed in trees, the products (fruits, leaves or piths) of which the chimpanzees fed on (Table 2). Almost half of the monitored beds were constructed in *Pycnanthus angolensis* trees. The M group chimpanzees frequently fed on the fruits of this tree during the study period.

The difference in mean life span of beds between two tree species (*Pycnanthus angolensis* and *Xylopia parviflora*) was not significant (Table 3). The difference in mean life span of beds among different levels of shade at the beds was also insignificant for all beds and for beds constructed in *Pycnanthus angolensis* trees (Table 4).

Table 5 summarizes the mean life span of chimpanzee beds at several study sites. Mean life span of beds in this study is slightly longer than that in the work of Ghiglieri[1] or Tutin and Fernandez[2] but slightly shorter than that of Skorupa cited in Plumptre and Reynolds[4]. Plumptre and Reynolds[4] used a different definition of the decay of beds: if the bed had lost all of its leaves (even though dead twigs might be present), it was not counted as a bed. Using this definition, the mean life span of beds in the present study is slightly longer than that in their work. Plumptre and Reynolds[4] reported that Budongo forest is drier than Kibale forest or the forests in Gabon, and thus it is likely that the leaves that formed the beds dried up and fell off more quickly. They also found that mean dry season survival time of beds was significantly shorter than mean wet season survival of beds. On the other hand, Wrogemann[7] found that bed decay was significantly slower in dry seasons than in wet seasons in Gabon. McGrew, Baldwin and Tutin[8] placed the Kasoje area in the next-drier position to Budongo forest on a wet-dry spectrum. Mean life span of beds in the present study is slightly longer than that in the Budongo forest. Consequently, bed decay is not affected simply by season or rainfall.

Table 4. Comparison of life span of chimpanzee beds according to the presence of shade.

Presence of shades	Number of beds	Mean (Days)	Range (days)
(a) all beds*			
Present	24	133	55-189
Absent	17	127	39-185
(b) Beds in *Pycnanthus angolensis***			
Present	16	139	56-189
Absent	5	126	64-182

*: Difference according to presence of cover was not significant (Mann-Whitney's U-Test, n_1=24, n_2=17, z=-0.93, p=0.35, 2-tailed). **: Difference according to presence of cover was not significant (Mann-Whitney's U-Test, n_1=16, n_2=5, U=37.5, p>0.05, 2-tailed).

Table 5. Comparison of life span of chimpanzee beds among several study sites.

Study site	Number of beds	Mean (days)	Range (Days)	Mean* (Days)	Range* (days)	Source
Mahale	41	131	30-189	49	18-110	This study
Budongo	96			45	10-161	Plumptre & Reynolds (1996)
Kibale	28	111	15-202			Ghiglieri (1984)
Kibale		144				Skorupa (1988) cited in Plumptre & Reynolds (1996)
Gabon	49	118	35-151			Tutin & Fernandez (1984)

*: These values were defined by Plumptre & Reynolds (1996).

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